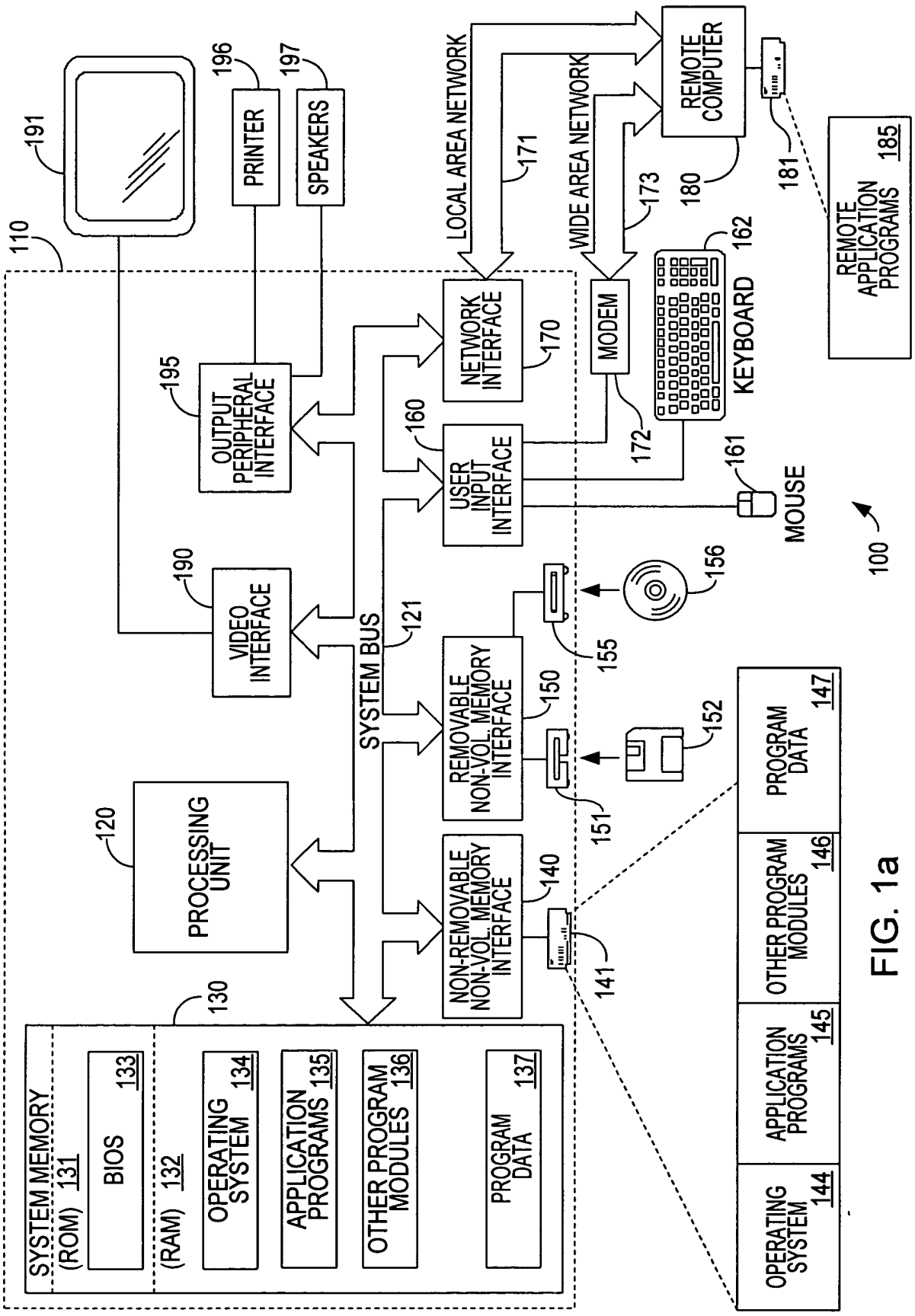
110
191
196
PRINTER
197
SPEAKERS
LOCAL AREA NETWORK
171
WIDE AREA NETWORK
173
REMOTE COMPUTER
180
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REMOVABLE NON-VOL. MEMORY INTERFACE
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PROCESSING UNIT
140
NON-REMOVABLE NON-VOL. MEMORY INTERFACE
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APPLICATION PROGRAMS 145
OPERATING SYSTEM 144
130
SYSTEM MEMORY
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BIOS 133
(RAM) 132
OPERATING SYSTEM 134
APPLICATION PROGRAMS 135
OTHER PROGRAM MODULES 136
PROGRAM DATA 137

FIG. 1a

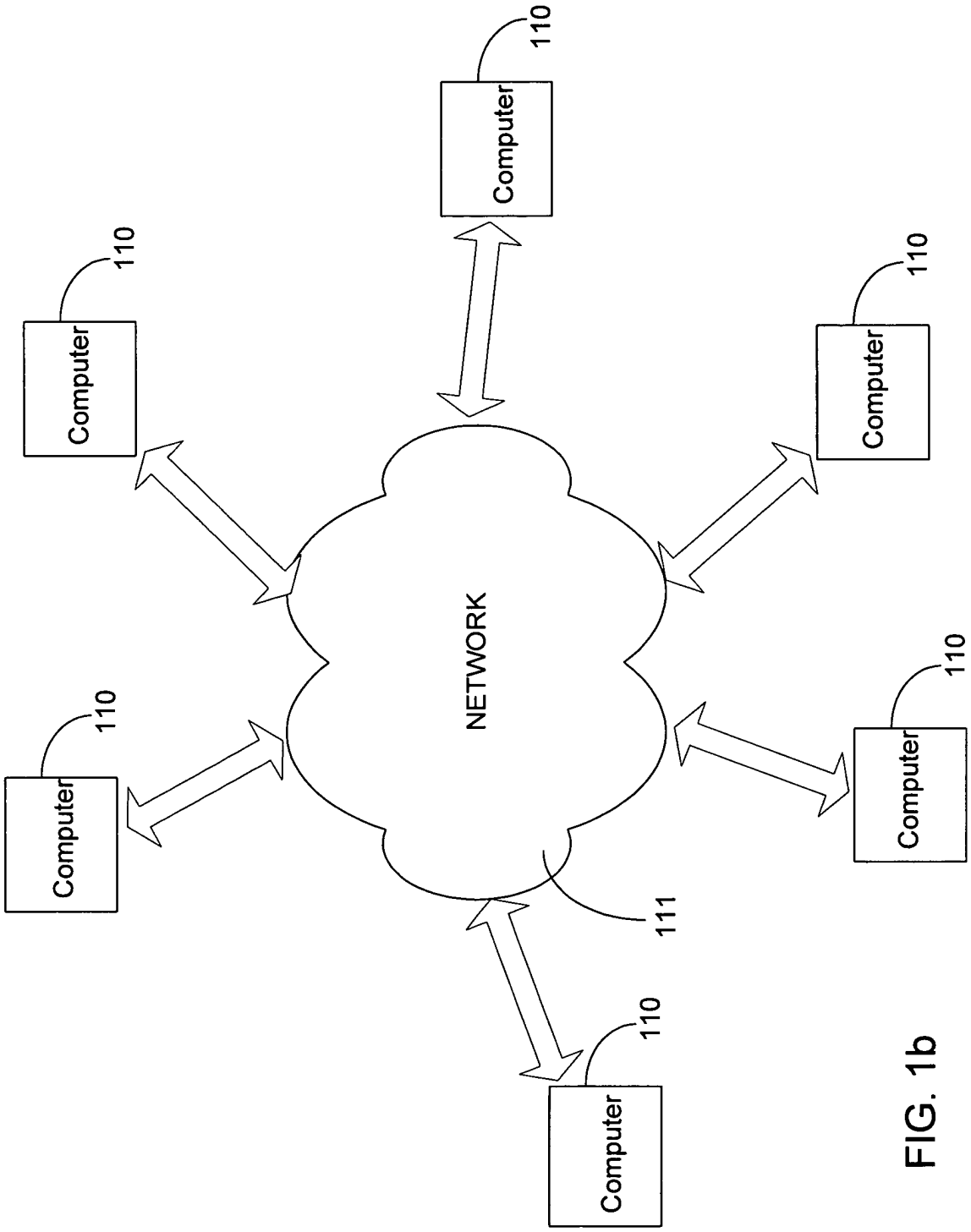

FIG. 1b

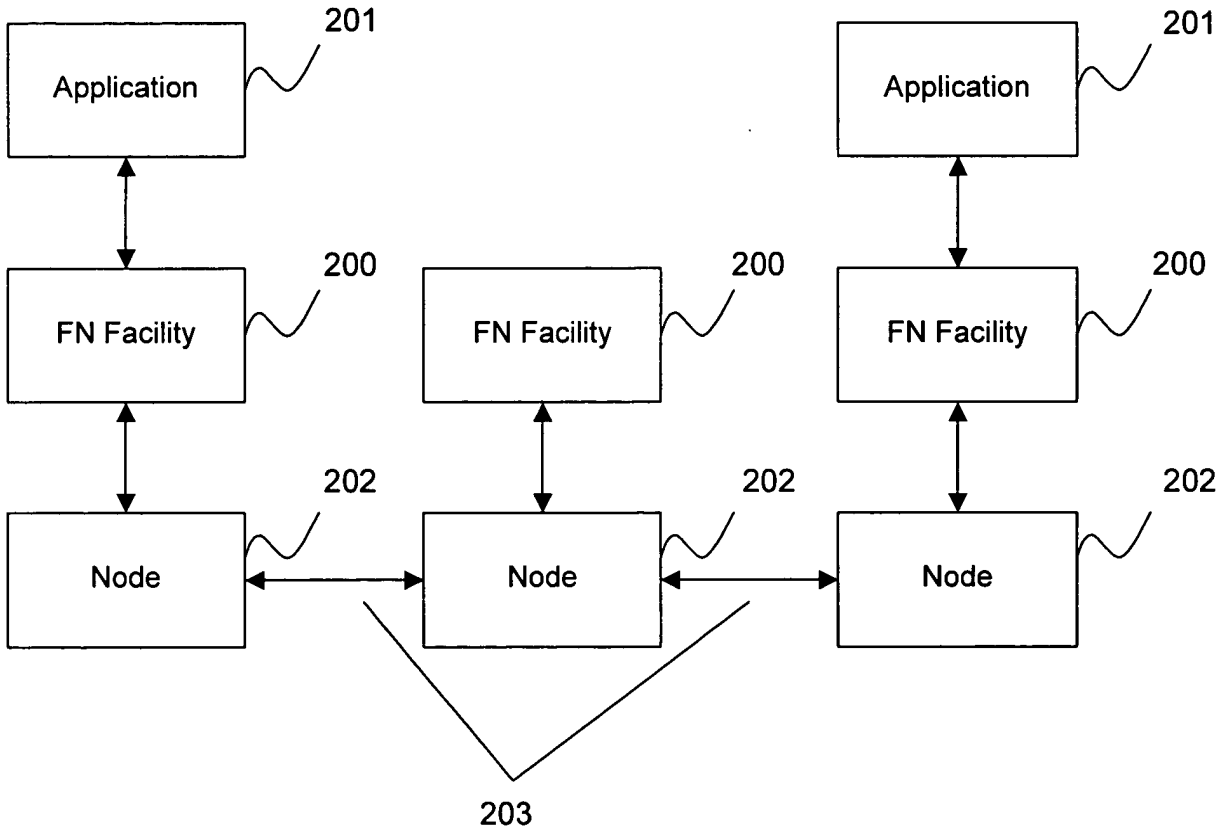
Application
201
Application
201
FN Facility
200
FN Facility
200
FN Facility
200
Node
202
Node
202
Node
202
203

FIG. 2

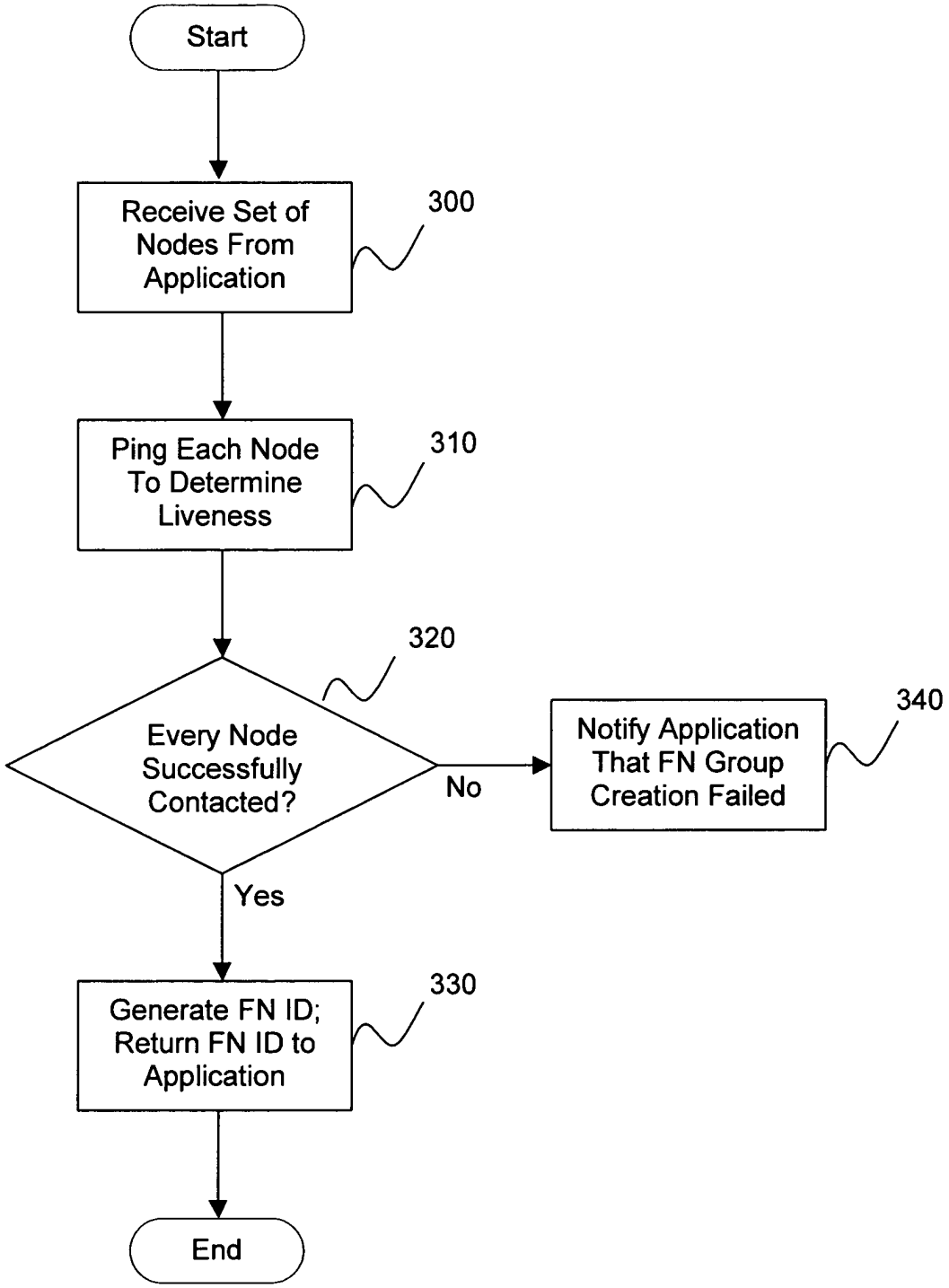
Start
Receive Set of Nodes From Application
300
Ping Each Node To Determine Liveness
310
320
Every Node Successfully Contacted?
No
Notify Application That FN Group Creation Failed
340
Yes
Generate FN ID; Return FN ID to Application
330
End

FIG. 3a

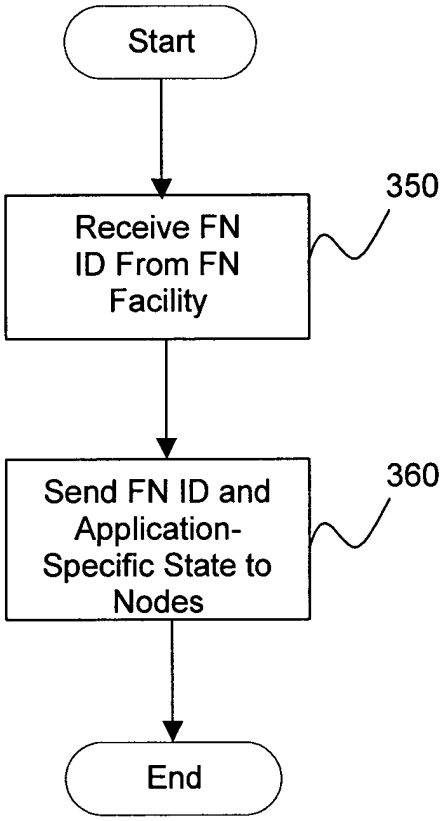
Start
Receive FN ID From FN Facility
350
Send FN ID and Application-Specific State to Nodes
360
End

FIG. 3b

```
// Creates an FN group containing the nodes in the set
FuseId CreateGroup(NodeId[] set)

// Registers a callback function to be invoked
// when a notification occurs for the FN group
void RegisterFailureHandler(Callback handler, FuseId id)

// Allows the application to explicitly cause
// transmission of a failure notification
void SignalFailure(FuseId id)
```

FIG. 4a

```
// Creates an FN group containing the nodes in the
// set and directs the nodes in the set to associate
// the application-specific state with the FN group
FuseId CreateGroup(NodeId[] set, ApplicationState state)

// Registers a callback function to be invoked
// when a notification occurs for the FN group
void RegisterFailureHandler(Callback handler, FuseId id)

// Allows the application to explicitly cause
// transmission of a failure notification
void SignalFailure(FuseId id)
```

FIG. 4b

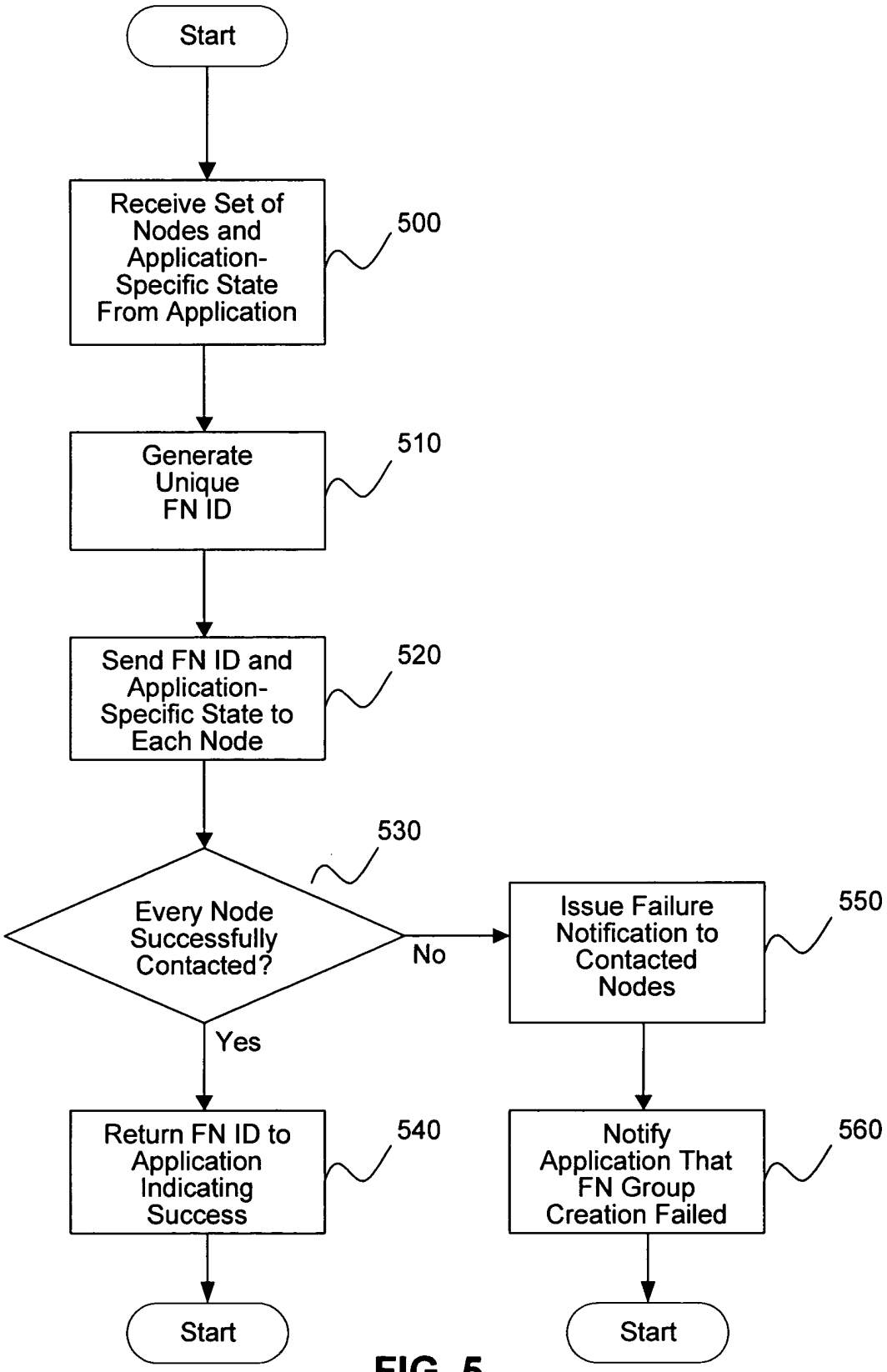
Start
Receive Set of Nodes and Application-Specific State From Application
500
Generate Unique FN ID
510
Send FN ID and Application-Specific State to Each Node
520
530
Every Node Successfully Contacted?
No
Yes
Issue Failure Notification to Contacted Nodes
550
Return FN ID to Application Indicating Success
540
Notify Application That FN Group Creation Failed
560
Start
Start

FIG. 5

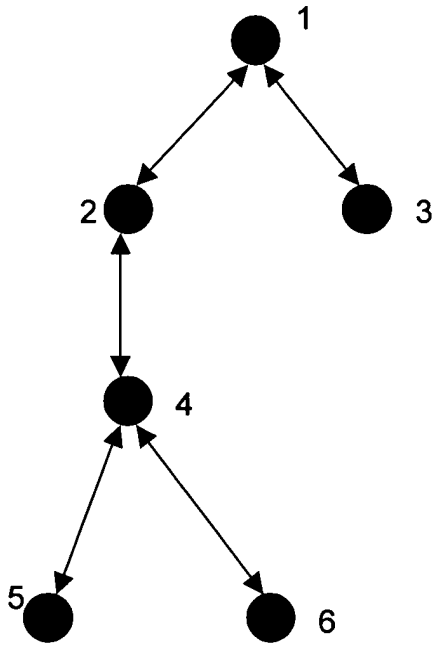

FIG. 6

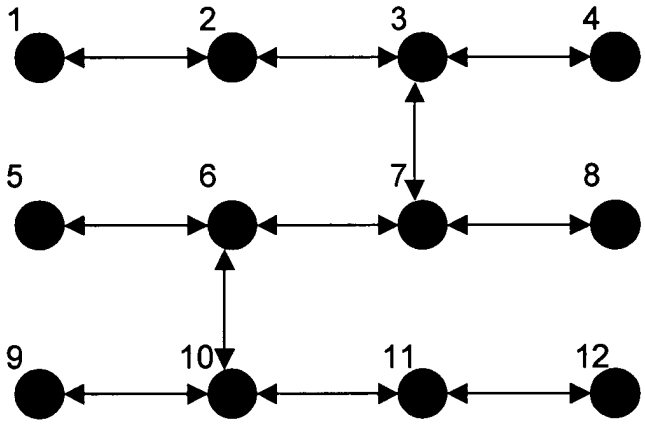

FIG. 7

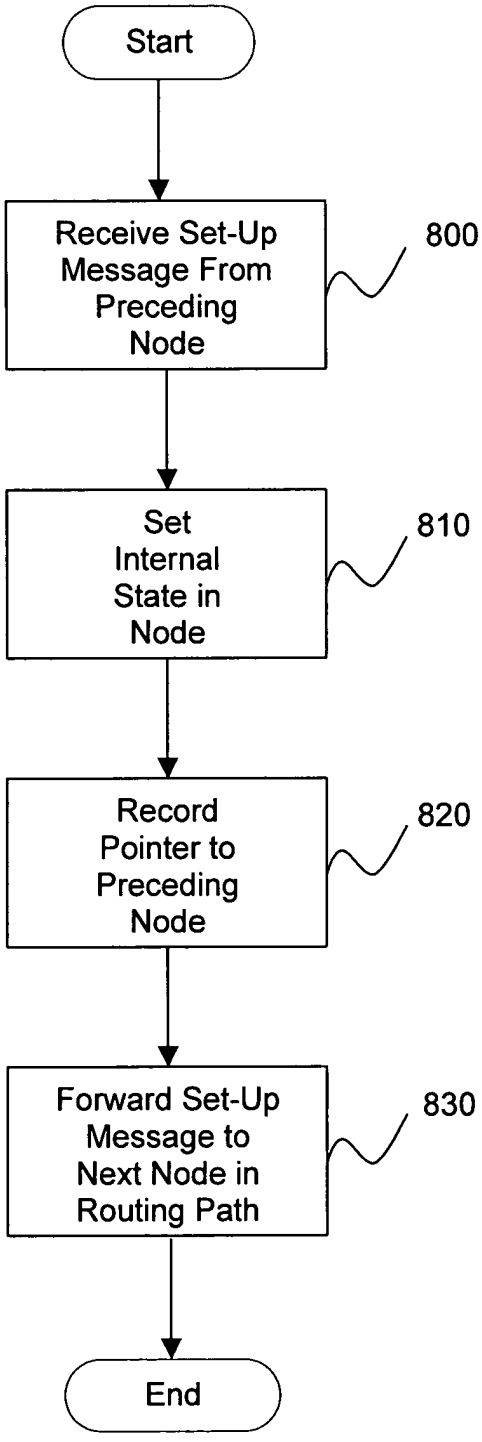
Start
Receive Set-Up Message From Preceding Node
800
Set Internal State in Node
810
Record Pointer to Preceding Node
820
Forward Set-Up Message to Next Node in Routing Path
830
End

FIG. 8a

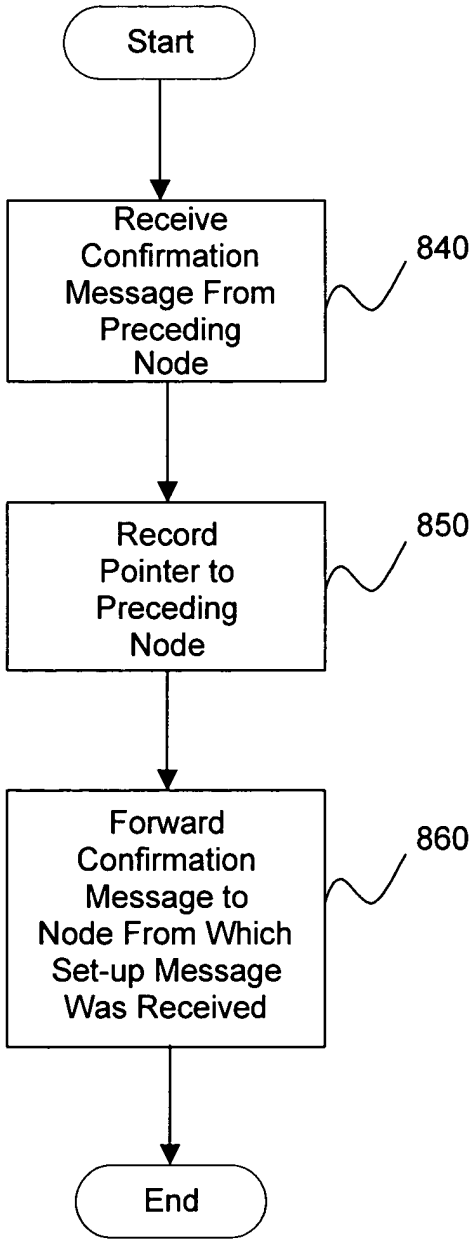
Start
Receive Confirmation Message From Preceding Node
840
Record Pointer to Preceding Node
850
Forward Confirmation Message to Node From Which Set-up Message Was Received
860
End

FIG. 8b

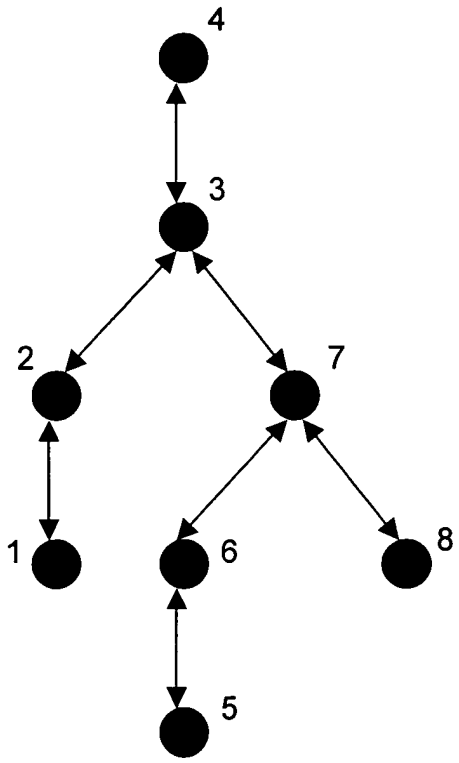

FIG. 9

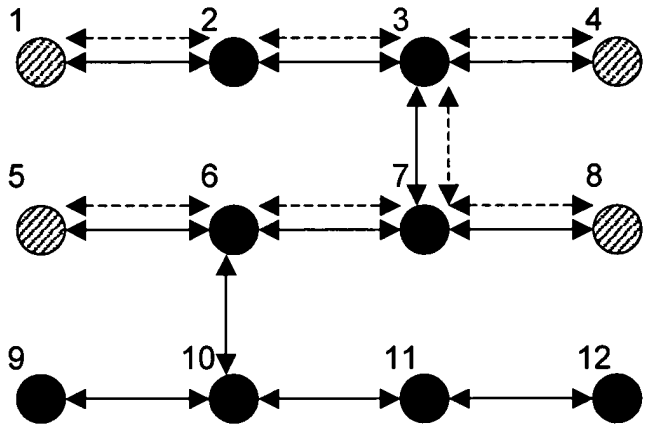

FIG. 10

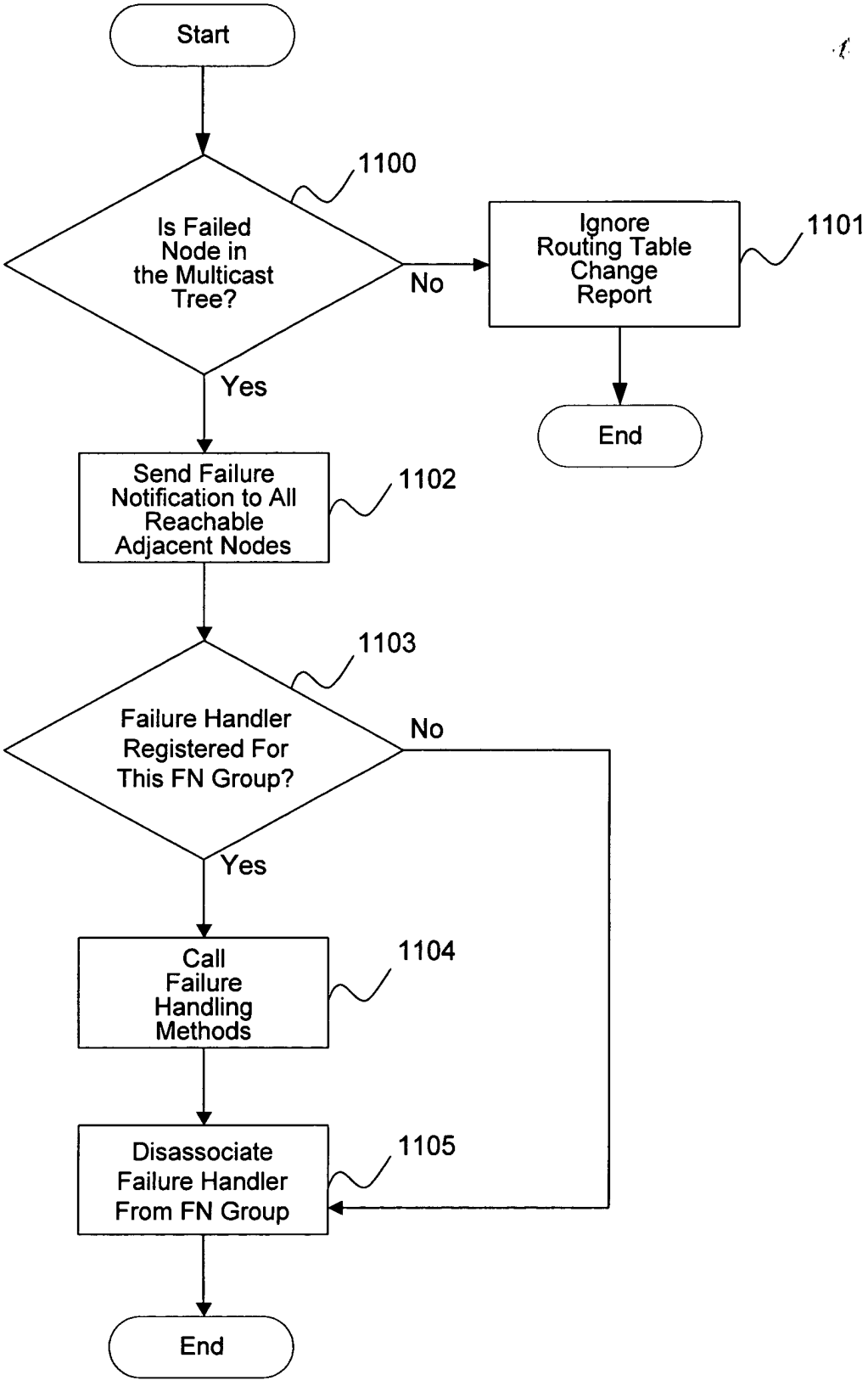
Start
1100
Is Failed Node in the Multicast Tree?
No
Ignore Routing Table Change Report
1101
End
Yes
Send Failure Notification to All Reachable Adjacent Nodes
1102
1103
Failure Handler Registered For This FN Group?
No
Yes
Call Failure Handling Methods
1104
Disassociate Failure Handler From FN Group
1105
End

FIG. 11